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Problems And Opportunities Associated With Aspen Logging Systems[1]

Wendell H. Groff[2]

The opportunities in equipment selection, production ranges and specialization available to a logger producing volume from a coniferous species in many cases are not available to an aspen logger. The logger must identify the limiting factors and design a logging system accordingly.

The subject of harvesting aspen has long been of interest to both industry and the land management agencies in the Rocky Mountain Area. Industry, in many cases virtually starved for raw material, has viewed aspen as an alternative to the usual coniferous species as a resource base. The land management agencies, aware of the pressing need for forest products and the restraining effect of ever increasing land use restrictions, have looked upon aspen as a means of increasing the productivity of available forest lands both through managing lands with production of aspen as the objective and through harvesting aspen with the objective of fostering production of the coniferous species.

While aspen does present an opportunity in terms of available wood fiber, the nature of the species combined with the present state of development of the industries utilizing aspen as a raw material place serious limitations upon one who must design an efficient logging system to harvest aspen. Please note that a "logging system" includes all aspects of the operation needed to move useable logs from the standing trees to the processing facility. We must consider access roads, contractual requirements and value of end product as well as such normal logging activities as felling, skidding and so forth.

From the outset, we must remember that the industry in the Rocky Mountain Area is logging aspen in relatively limited quantities at the present time. Aspen trees make logs and we know how to put logs into the mill. However, most aspen logging that I know of is being done with logging systems designed to produce logs from the coniferous species. In many cases this situation presents a problem in that the logging system in use is relatively inefficient when compared to one that could be designed to harvest aspen alone.

With the realization that present harvesting systems are successful to a degree in mind, the remainder of this report will present my own thoughts on why aspen is expensive to log in relation to the coniferous species and how these costs might be reduced.

Please note that I am speaking in very general terms. My comments are the result of my own experience with logging aspen in Southern Colorado and as such may not apply in other regions of the Rocky Mountain area.

General Remarks On Aspen As A Species

The aspen that I have worked with in the Rocky Mountains has really presented problems for the logger. It has been generally highly defective in terms of both visible and hidden rot, extremely crooked and of relatively small size. It seems that almost anything that can be wrong with a log will occur in aspen.

Aspen, when harvested for sawlogs, is commonly designated for cutting under one of three methods:

When aspen occurs in a mixed stand it may be individually tree marked to be cut along with the coniferous species.

In pure stands aspen may be designated for cutting on a diameter limit basis; a clear-cut if you will.

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In a mixed stand with a managable but sub-merchantable coniferous understory the aspen may be designated for cutting by over-wood removal to foster growth of the understory.

These methods of harvest have been mentioned to illustrate the different logging situations that the logger must be prepared to contend with. The point is that it is almost impossible to design a logging system that will operate with equal efficiency in all three cases.

Aspects Of Aspen Logging That Increase Cost

Please note that my comments are directed toward the present situation in the Rocky Mountain area. Problems such as these occur when aspen is harvested by logging systems designed to produce volume from the coniferous species.

In my mind, the problems associated with logging aspen fall into three broad categories.

I. Nature Of The Species

As I mentioned before, just about anything that can be wrong with a log will probably occur in aspen. This condition causes the work that must be done to produce a usable log to increase. Since per unit logging costs are simply a function of the amount of man and machine cost necessary to produce usable logs this increased work must result in higher unit costs. The loggers simply must do more work per unit of production.

II. Contractual Restrictions

This topic is of prime interest to land managers who are working toward a management objective. To the logger, contractual requirements will either increase or reduce the amount of work that he must do. The per unit costs of logging production will vary almost in direct proportion to the variation of work required.

Among the contractual requirements that have the most drastic effect on logging costs are:

Protection of residual stands when working with individual tree mark or over-wood removal harvesting systems. Required logging practices that cause higher logging costs are such things as longer skid distances, pulling winch lines further, restricting log lengths, and restricting number of chokers. All of these restrictions may result in a loss in production per unit of time.

Slash treatment and/or disposal. The time that logging crews spend on slash treatment is time lost from actively producing logs. The more unproductive, in the sense of producing logs, work that they must do the more the per unit cost or production will rise.

High standard access roads may simply price the aspen logs involved out of the market.

Present utilization requirements specify that all sound wood that meets contractual specifications must be removed. This requirements causes real problems for a logger who must produce logs in eight foot multiples.

In my oninion, most of the problems that occur because of contractual restrictions are the result of applying a timber sale contract designed for a relatively high value species to low value aspen timber. In many cases the value of the end product to be derived from aspen logs will not cover the cost of producing those logs.

III. Economic Restrictions

The problems that fall under this category relate to the equipment choices available to the aspen logger and the opportunity for him to utilize that equipment in an efficient manner. Among the situations that are presently restricting the alternatives available to the logger are:

The mills currently utilizing aspen generally require a relatively small volume of wood annually. This means that a logger cannot really "gear up" for production unless he can work his men and equipment in other areas some of the time.

Relatively short operating seasons can further reduce the amount of time that the logging crews are working.

The value of aspen logs will many times not support high standard access roads. This can cause even more unproductive time as well as increased equipment repair cost.

These factors and others combine to effectively limit the time that an aspen logger actually spends producing logs. When one considers the effect of fixed cost and overhead it becomes apparent that per unit costs of production must go up unless the logger can produce at maximum efficiency.

Opportunities To Minimize The Cost Of Aspen Logging

Again let me emphasize that we are logging aspen right now. My comments are intended to present ways through which cost might be reduced in some situations. Careful planning of the logging operation, analysis of the logging situations to be encountered and cooperation between all organizations involved can at least minimize the effects of the restricting influences noted above.

Among the things that must be considered are:

I. Minimize The Effects Of The Nature Of The Species

Barring genetic development of a straight, sound aspen tree growing in a stand that produces 15,000 board feet per acre we can't do much about it.

II. Minimize The Effects Of Contractual Restrictions

The land managers must be aware of and practice the concept of "cost of log to mill". For the present time at least, it must be realized that perhaps the optimum level of land management cannot be achieved.

One possible way to reduce the cost of aspen logging would be to design a timber sale contract that recognizes the low value of the species and makes requirement of work accordingly. Within the value of the log, work and the associated cost elements should be allocated to the most desireable management objectives.

III. Minimize The Effects Of Economic Restrictions

The logger can do nothing about the nature of the species and very little about contractual restrictions. Further, short of moving to another area, he can do little if anything about the annual needs of the mill that he is working for.

However, through planning, analysis and initiative the logger can reduce his own logging cost by using the factors of production in the most efficient way available to him. Among the ways through which the logger can improve the efficiency of his operation are:

> If the mill needs only 2,000-3,000 MBF of aspen annually and there are no alternative means to utilize logging capacity then the logging system should be designed to produce only that amount. Among the things that should be considered are multi-use equipment such as self-loading log trucks, small crawler tractors, timber sales with primary access roads already in place and single species timber sales.
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> The logger should attempt to develop a market for all species of logs. This would allow him to extend the logging season, select single-use and more efficient equipment such as feller-bunchers and grapple skidders, work on mixed species timber sales and produce a higher volume annually.
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> All of these occurances would have a favorable effect on logging costs.

The essential point is that the logger must be aware of the restricting influences under which he must work and design a logging system to fit a given situation. The equipment choices, production ranges and specialization available under conventional logging systems designed to produce logs from the coniferous species may simply not be available to an aspen logger. Therefore, he must either reduce his cost through proper equipment selection or increase his volume produced through developing a market for other species.

In this report I have tried to summarize my thoughts on and experience with aspen logging. In my experience it has generally been more expensive to log aspen than one of the coniferous species. I have been asked why many times and it always comes down to volume produced per unit of time. It appears to me that conventional logging systems, from standing tree to processing facility, have not produced aspen logs as efficiently as they might be.

The opportunity to reduce the cost of logging aspen does exist in certain areas, particularly those where multi-species utilization is the common practice. In these areas careful planning in scheduling operations and init-

iative in developing a market for logs from the coniferous species will allow the logger to operate more efficiently.

In conclusion, three points should be made:

The amount by which the "cost of log to mill" can be reduced through more efficient logging practices is relatively minor when compared to the reductions which can occur through elimination of certain contractual requirements.

The most efficient logging systems require heavy capital investment. I personally cannot foresee a prudent logger making that investment unless he is assured of a long-term, high annual volume logging contract. At the present time it appears to me that these conditions cannot be met in the Rocky Mountain area.

The most potential for development of an efficient aspen logging system lies first with the land management agencies and secondly with industry in that high volume facilities must be developed.

Remember, the logger must have timber to log and he must have someplace to log it to.